ISBNPA
International Society of Behavioral Nutrition and Physical Activity
Ghent, Belgium - May 22 - 25

P353

Effects of different exercise frequencies on body composition and physical fitness in overweight and obese young school-aged children.

Ana S. Alves [1], Aldo M. Costa [1,2,3] & Júlio C. Martins[1,4]

[1] University of Beira Interior; Covilhã, PORTUGAL
[2] Research Centre in Sports, Health and Human Development (CIDESD, Vila Real, PORTUGAL)
[3] Health Sciences Research Centre (University of Beira Interior ; Covilhã, PORTUGAL)
[4] Research Centre in Physical Activity, Health and Leisure (CIAFEL,; Porto, PORTUGAL)

INTRODUCTION

Obesity is considered to be one of the epidemics of the 21st century and the perspective is to increase in children and adolescents[1]. Furthermore, physical activity supplies health benefits by increasing children's aerobic fitness, bone mass and high-density lipoprotein (HDL) cholesterol, and by helping to reduce chronic diseases like obesity and hypertension. Public health physical activity guidelines address the exercise needs of children and adolescents[2]. However, there are few published studies that demonstrate what are the most effective exercise frequencies to obtain better results in body composition and physical fitness. The purpose of this study was to evaluate short-term effects of multicomponent exercise training with different exercise frequencies on body composition (BC) and physical fitness (PF) in overweight and obese young school-aged children.

METHODOLOGY

DESIGN

Study sample underwent in three experimental conditions. Two experimental groups (G1, n=10, three exercise sessions/week; G2, n=10, two sessions/week) and a control group (CG, n=20) were constituted.

SAMPLE

Twenty overweight (body mass index (BMI) ≥ 85th percentile) young school-aged children (14.83 ± 1.5 years old) of both gender attending a high school in Portugal participating in a school based physical activity program, were studied.

EXPERIMENTAL PROTOCOL

A ten-week multicomponent aerobic, strength and flexibility exercise program, complementary to physical education classes was created. Body composition (BMI and body fat percentage [BFP]), aerobic capacity (PACER - Progressive Aerobic Cardiovascular Endurance Run), muscular strength and resistance (curl-ups and push-ups) and flexibility (backsaver sit and reach test), were assessed by *FITNESSGRAM®*. The *FITNESSGRAM®*, developed by The Cooper Institute, is the testing protocol used in the recently established Presidential Youth Fitness Program, created by the President's Council on Fitness, Sports & Nutrition[3]. Guidelines for children and adolescents are daily physical activity behaviors of 60 minutes or more. The physical activity behaviors should contain a minimum of 3 days per week of aerobic, muscle-strengthening, and bone-strengthening activities[3]. The training program has taken 60 minutes and comprised 4 phases: warm up (5 minutes of aerobic dance), cardiorespiratory fitness (40 minutes of aerobic exercises like team sports, ski, swimming, hiking, exercise bike, treadmill, rowing machine, elliptical trainer, hidrogymnastic exercises, peddy papers, ..), muscular strength and resistance (10 minutes of bodyweight exercises like resistance bands, dumbbells, machines circuit, ...) and cool down (5 minutes of breathing and flexibility exercises). Two different evaluation moments were made (before the training program started and after 10 weeks of training. Were made always at the same day and hour to all sample).

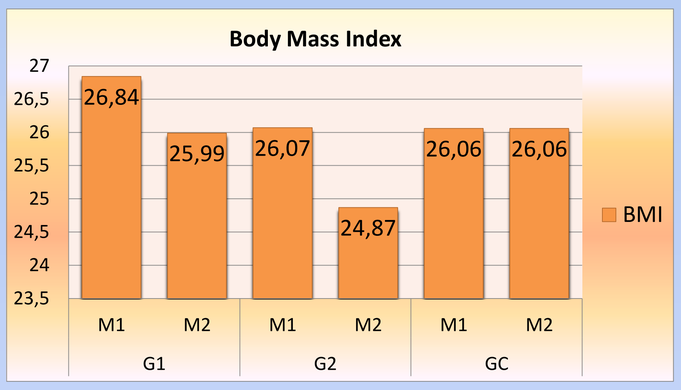

Chart 1: Body Mass Index in moment 1 and 2 in all groups

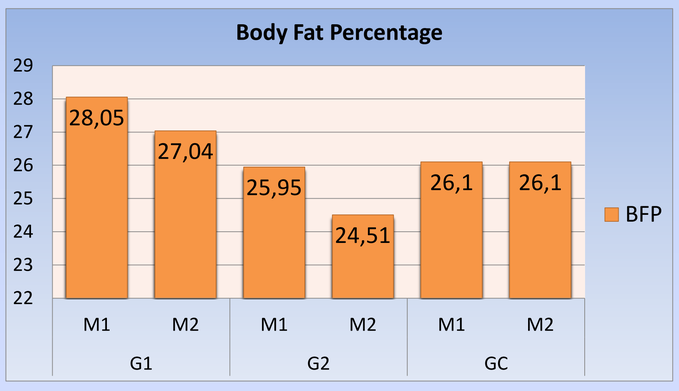

Chart 2: Body Fat Percentage in moment 1 and 2 in all groups

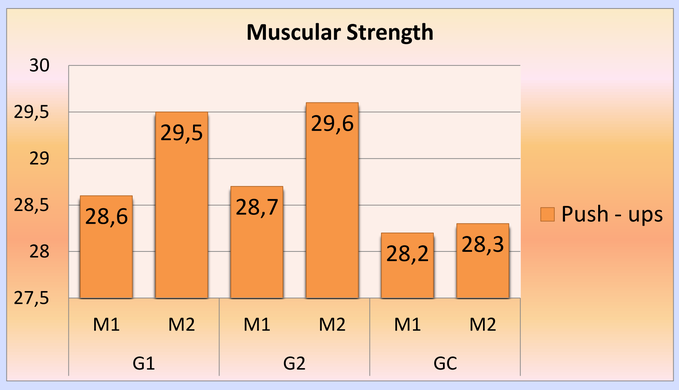

Chart 3: Muscular Srength (Push-ups) in moment 1 and 2 in all groups

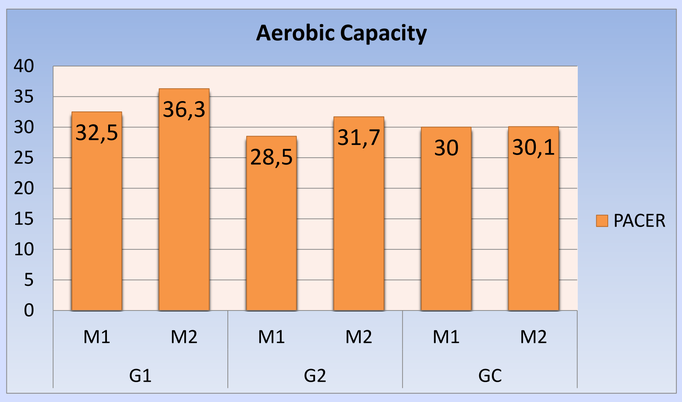

Chart 4: Aerobic Capacity in moment 1 and 2 in all groups

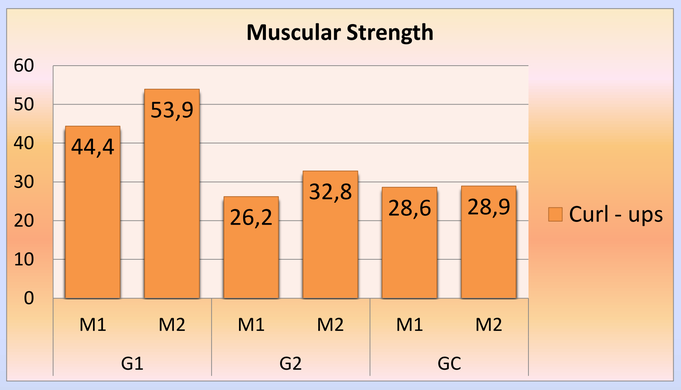

Chart 5: Muscular Strength (curl-ups) in moment 1 and 2 in all groups

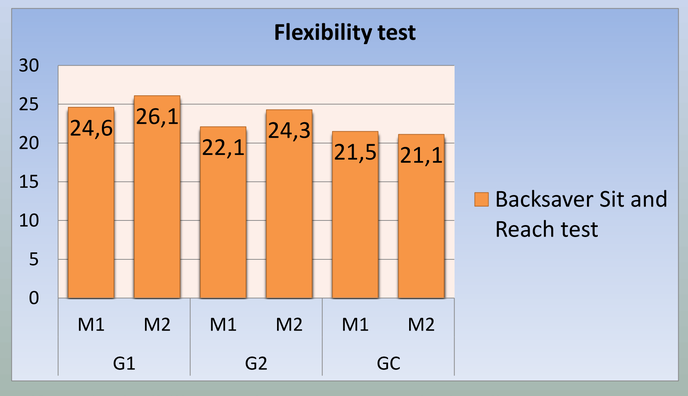

Chart 6: Flexibility test in moment 1 and 2 in all groups

STATISTICAL ANALYSIS

Normality assumption was tested with *Shapiro-Wilk test*. Two non-parametric statistical tests (*Wilcoxon signed-rank test and Mann-Whitney U*) for statistical procedures were used. *Wilcoxon signed-rank test* was used to compare a group in two evaluation moments; *Mann-Whitney U test* was used to compare several groups and variables in an evaluation moment. The statistical significance was set to $p<0.05$.

RESULTS

Mann-Whitney U identified significant differences in **BMI** (G1 – 26.84 ± 3.55 vs. 25.99 ± 3.26; $p = 0.008$; G2 – 26.07 ± 1.74 vs. 24.87 ± 2.03, $p= 0.005$), **BFP** (G1 – 28.05 ± 5.34 vs. 27.03 ± 4.96, $p = 0.008$; G2 – 25.95 ± 6.29 vs. 24.51 ± 6.07, $p = 0.005$), **PACER Test** (G1 – 32.5 ± 12.7 vs. 36.3 ± 11.59, $p = 0.016$; G2 – 28.5 ± 11.9 vs. 31.7 ± 10.78, $p = 0.013$), **Curl – ups** (G1 – 44.4 ± 17.5 vs. 53.9 ± 18.84, $p = 0.012$; G2 – 26.2 ± 13.4 vs. 32.8 ± 12.54, $p = 0.008$), **Push – ups** (G1 – 8.4 ± 5.93 vs. 11 ± 5.33, $p = 0.007$; G2 – 8.7 ± 4.64 vs. 10.5 ± 3.66, $p = 0.041$) and **Backsaver sit and reach** (G1 – 24.6 ± 5.7 vs. 26.1 ± 4.81, $p = 0.017$; G2 – 22.1 ± 7.14 vs. 24.3 ± 6.01, $p = 0.016$). However, no significant differences between G1 and G2 were observed. Control group did not record any change at all in the assessed parameters.

CONCLUSIONS

Short-term multicomponent exercise training improves BC and PF in overweight and obese young school-aged children. However, different exercise frequencies (two and three sessions/week) appear to produce similar results over 10 weeks of training.

REFERENCES

[1] Antonogeorgos G, Papadimitriou A, Panagiotakos DB, Priftis KN, Nicolaidou P. (2011). Association of extracurricular sports participation with obesity in Greek children. *J Sports Med Phys Fitness*, 51(1), 121-7.
[2] Landry BW, Driscoll SW (2012). Physical activity in children and adolescents. *PM & R*,4(11), 826-32.
[3] Morrow, J. R., Tucker, J. S., Jackson, A. W., Martin, S. B., Greenleaf, C. A., & Petrie, T. A. (2013). Meeting Physical Activity Guidelines and Health-Related Fitness in Youth. *American Journal of Preventive Medicine, 44*(5), 439-444.

CORRESPONDENCE

Ana Sofia Alves
University of Beira Interior - **PORTUGAL**
anasofiaruivoalves@gmail.com